

THE

January, 1956

# CHEMIST

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VOLUME XXXIII

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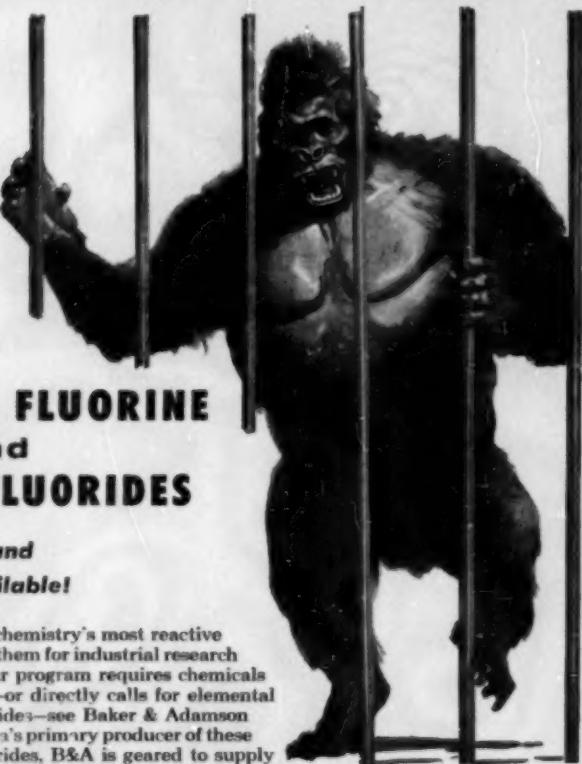
NUMBER 1

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**Dr. Charles C. Price, F.A.I.C.**  
*Receives Honor Scroll of Chicago AIC Chapter*  
*(See Page 7)*

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The Chemist and Management, Summary of Address by Dr. C. F. Rassweiler, F.A.I.C. Presentation of Pennsylvania Chapter Honor Scroll to Dr. Mary L. Willard, F.A.I.C.

An Outline for Creative Thinking, Dr. Maurice J. Kelley, F.A.I.C.

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Women in Chemistry, Dr. Mary L. Willard, F.A.I.C.

Presentation of Honorary AIC Membership to Dr. Harry B. McClure, F.A.I.C.

## Best Wishes for the New Year

### IN THIS ISSUE

#### Editorial:

Don't Forget! Dr. Ray P. Dinsmore, A.I.C. President	5
The Challenge of Science, Dr. Charles C. Price, F.A.I.C.	7
Charles C. Price—Personal Glimpses,	
Rev. Philip S. Moore, C.S.C.	8
Charles C. Price—The Scientist, Dr. Nelson J. Leonard	11
Presentation to Dr. Price	13
Professional Careers in Industrial Research,	
Dr. Mario Scalera	15
What the Research Executive Does as an Avocation,	
E. M. Bryman and Maurice Holland	20
Council	24
AIC Activities:	
Chicago Chapter report on "Management, Morale and the Professional Man	24
Washington Chapter report on "Chemicals and Tariffs" and "Underground Storage of Natural Gas"	25
Opportunities	26
Will You Come	27
For Your Library	28
Communications	30
Something New	35
Condensates	36

### TO COME IN FEBRUARY

What are the opportunities for women in chemistry today? Dr. Mary L. Willard, professor of chemistry at the Pennsylvania State University, answers this question in her address accepting the Honor Scroll of the Pennsylvania Chapter. She is, by the way, the first woman to receive an Honor Scroll from an AIC Chapter. (A valentine to her!) • Dr. Maurice J. Kelley, F.A.I.C., has reviewed various articles on creative thinking that appeared in *The Chemist* and elsewhere, and has extracted from them an outline that should be most helpful. • "The Chemist and Management," summary of an address by Dr. C. F. Rassweiler, F.A.I.C., offers some worthwhile suggestions to the individual chemist.

### TO SERVE YOU

R. S. Aries & Associates	36	The Lento Press	30
Baker & Adamson		Molnar Laboratories	27
Division	Inside Front Cover	William E. Phillips, Inc.	35
Bios Laboratories	33	Phoenix Chemical Laboratories	25
Croll-Reynolds Company	1	Robinette Research Laboratories	10
Fisher Scientific Company	6	Foster D. Snell, Inc.	29
Food Research Laboratories, Inc.	19	R. Steckler Laboratories	23
Harchem Division	Inside Back Cover	Arthur H. Thomas Co.	4
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## EDITORIAL

### Don't Forget

Dr. Ray P. Dinsmore

*President, The American Institute of Chemists, Inc.*

**F**ELLOWSHIP IN THE AMERICAN INSTITUTE OF CHEMISTS offers an opportunity for service to the chemical and chemical engineering professions which is unique. It requires only an active interest and realization of the possibilities on the part of our membership to move on to outstanding accomplishment.

It has been said in various ways that the INSTITUTE, unlike any other scientific society, has as its objective the promotion of the professional stature of the chemist and chemical engineer rather than offering opportunities for exchanging information with regard to technical developments. It has perhaps not occurred to many members that we have a small organization precisely because we endeavor to select members who have the interests of their professions at heart, and who are willing to devote their personal efforts to the promotion of the INSTITUTE's objectives.

Now, when our professional activities are more vital to the peace and prosperity of our country than ever before, the happiness and perhaps the very existence of untold numbers of people may well depend upon the way our professional obligations are discharged.

Your officers and Council are

studying ways of more effective achievement of the INSTITUTE's purposes, and I feel sure that our membership will steadily grow in strength as these purposes become more clear to a larger number of true professional people.

#### Honorary Membership to Dr. Newton

Dr. Roy C. Newton, F.A.I.C., vice president in charge of research, Swift & Company, Chicago, Ill., will receive Honorary Membership in The American Institute of Chemists, at a meeting of the Chicago AIC Chapter to be held February 17th, at the Engineers Club, Chicago, Ill. Speakers will include Dr. Gail Dack, head, Department of Bacteriology, University of Chicago, and head of the Food Research Institute; and Harold S. Mitchell, formerly director of the Laboratories of Swift & Company.

Dr. Newton is being honored for his brilliant leadership in food technology and research and for his support of the chemical profession.

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# The Challenge of Science

Dr. Charles C. Price, F.A.I.C.

*Blanchard Professor and Director of the Department of Chemistry,  
University of Pennsylvania, Philadelphia 4, Pa.*

(Excerpts from a talk given before the Chicago AIC Chapter when the author received its Honor Scroll, September 3, 1955, at a dinner in his honor in Chicago, Ill.)

SCIENCE OFFERS the challenge of an endless, ever-expanding frontier. Its exploration has already wrought revolutionary changes in the world in which we live and promises even greater developments in the future. But the rosy promise of science presents a vigorous challenge to our young men and women, to the scientists themselves, to industry, to our government, and to the world itself.

We need recruits for science with imagination and initiative. The prospect of exploring the unknown and of building the storehouse of human knowledge should be a challenge to the brightest intellects. The prospect of improving our weapons in the age-old struggle against disease, hunger, poverty and ignorance should be a challenge to the most compassionate human spirit. The scientists themselves must see the importance of responding to the challenge of interesting our young people in science as a career.

Our American industry should set a pattern of the use of science in all possible ways to serve humanity. This will set a challenge to the world and will inspire men everywhere with the

miracle of production that free men can provide with a free economy, regulated only to the extent necessary to insure its operation for the general welfare of all. Our industry must also realize that its production of today has flowed from research ideas and educated men of yesterday and must be prepared to invest increasingly in our universities, which are the basic source of both research and educated men.

Our government now plays an immense role in the scientific activities of our country. It is a challenge to scientists and laymen alike to work for government policies which will have a beneficial and stimulating impact on science. The necessary relationship of so much of science and of so many scientists to the military potential of our country has created serious problems antagonistic to the long-range progress of science. The concentration of money, and therefore of effort and talent, on short-range development has seriously weakened the position of fundamental research in the universities. The need for security has restricted the free flow of scientific information — the life blood

of progress in research. The handling of personnel security policies in particular, and the general deadening hand of bureaucratic red tape has been a serious deterrent to attraction of the best scientific talent to the government research laboratories.

In addition to its own research activities, the progress of our nation's scientific activities can be effectively promoted by agencies such as the National Science Foundation and the National Institutes of Health.

Perhaps the greatest challenge of science to humanity results from the fact that today the world has become a single, interrelated, interdependent community, with a promise of world-wide economic develop-

ment and a threat of universal destruction undreamed of half a century ago. Lessons of history prove that peace, freedom and justice in any community have only been achieved as the result of establishing law and order under government. Unless we can establish world peace by building the United Nations into such an instrument, science may only have served to contribute to the extinction of *homo sapiens*. We must inspire some of our ablest intellects and some of our wisest statesmen to recognize that scientific progress has made it essential to get down to the business of planning the strategy and tactics of how this goal might be achieved.

## Charles C. Price — Personal Glimpses

Rev. Philip S. Moore, C.S.C.

*Vice President, Academic Affairs, University of Notre Dame,  
Notre Dame, Indiana*

LIKE OTHER American universities, Notre Dame marked time during the years of World War II in its academic development. Almost all our undergraduate students were enrolled in the training programs for the Navy; graduate students were very few indeed; the faculty, especially in science, were on leave of absence to other research centers or engaged in highly secret government research or overburdened with the undergraduate naval programs. But in the spring of 1945 the war in Europe

ended, and although we did not then foresee that the war in the Pacific would end with unsuspected suddenness a few months later, the time had arrived to begin implementing plans for the post-war period. Among these plans was the appointment of a new head of the Department of Chemistry.

We were looking for a fairly young man who would give dynamic, forward looking leadership to the Department. Since we had decided to pass over the men already at Notre

CHARLES C. PRICE . . .

Dame, we were looking also for a man whose personality and character would enable him to step in from the outside and create harmony and co-operation and not dissension among the faculty. Among the men who were considered for the post was Dr. Charles Price, then at the University of Illinois. He was a young man—only thirty-two years old. From his record, we knew that he had already done pretty important work in chemistry and gave promise of the leadership which we wanted. But did he have the personality and character for which we were looking?

Well, Dr. Price came to the University for interview, and it did not take us long to decide that here was not only a young chemist of great promise but also a man of pleasing personality and of deeply religious character who could win the cooperation and respect of all those who were to work with him. Dr. Price became the head of our Department of Chemistry a few months later. We never regretted our choice because he proved to be all that we had judged him to be.

I suppose many of you know that Dr. Price is a Quaker. I am sure all of you know that Notre Dame is a Catholic university. But from the day he arrived at Notre Dame until the day he left to assume a similar position at the University of Pennsylvania, the highest mutual respect, admiration, and affection existed between him and his colleagues on the

faculty and in the administration. Dr. Price respected the objectives of Notre Dame, and we scrupulously respected his freedom of conscience.

I personally became closely acquainted with Dr. Price and with his charming wife, Mary Alma. I visited in their home frequently and saw at close range their beautiful family life. I experienced the warm human bonds of affection which bound them together and to their five lovely children. It was a religious household—yes, a rather strictly religious household; it was a disciplined household, but it was a discipline enforced by love, and there was plenty of gaiety and the healthy, sometimes noisy, activity one expects to find in a home of five growing youngsters.

And so I came to know Charlie Price as a fine Christian gentleman and as an exemplary husband and father. But I also soon came to know him as a man who was deeply conscious of his responsibilities as an American citizen. He was especially sensitive to post-war world conditions, with the cold war and looming threats to peace. He became a student of international relations and domestic politics.

While not minimizing the need for immediate policies and measures to preserve peace under conditions which then existed, and which still exist, Dr. Price, like many other thoughtful citizens, came to the conviction that neither strength of arms nor balance of power nor any of the conventional

methods of diplomacy could guarantee peace in this twentieth century world in which new means of transportation and communication had greatly changed the significance of geographical distance and in which atomic and hydrogen weapons of destruction demanded a complete revision of our concepts of war. In such a world only a world organization with limited but effective powers to maintain order among nations under law could ultimately assure peace.

Dr. Price also understood that peace is not merely the absence of war but something positive which must be worked for — something which demands the all-out efforts of intelligent citizens just as much as the successful carrying on of war requires such efforts. He, therefore, became an active member of United World Federalists on both local and national levels, and few have contributed more constructive thinking to this movement than has he. But Dr. Price went further. Though he had a natural repugnance to politics and was fully aware that his scientific work would suffer and that for this he could be criticized, his conscience and sense of duty drove him to seek public office. He entered the political arena first as candidate for United States Senator and then as United States Representative from Indiana. He was unsuccessful in those political ventures, and perhaps providentially so. But as one who advised him during that time, I know the deep convictions which

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drove him into political activity. I know that he was deeply convinced that his scientific training would enable him to serve his country best as member of the Congress. And hence he was willing to make the great personal sacrifices in his family life and in his scientific career, and to bear the criticism he received, in order to do his duty to his country as he then saw it. Such devotion to conscience and to duty could not but win my admiration, even though I never fully agreed with Dr. Price!

Dr. Price was an active member of his Church and a participant in civic and social activities of the South Bend and Notre Dame communities. We are the better because he spent some nine years among us. The same is true of Mary Alma.

And so I welcome this opportunity to tell them that we were happy to have them as members of the Notre Dame family, to rejoice with them in this new honor which has come to Dr. Price, to assure them that they will have abiding place in our memories and affections, and to invoke God's blessing on them and their children in the years that lie ahead.

# Charles C. Price — The Scientist

Dr. Nelson J. Leonard

*Professor and Head of the Division of Organic Chemistry,  
University of Illinois, Urbana, Illinois*

IT IS DIFFICULT to give separate consideration to Dr. Charles C. Price as the scientist since the vigor and breadth of his personality pervade his scientific endeavor as they do the many facets of his energetic life. He is known with familiarity throughout the world's fellowship of chemists as "Charlie," and his presence in any group, on any symposium, is a guarantee of a stimulating exchange of ideas and a spirited probing of chemical problems. His gift lies in the versatility and intensity of his interest.

These traits are evidenced in his research work, which has resulted in scores of publications and has ranged over the fields of polymerization and copolymerization, reaction mechanisms, sulfur chemistry, heterocycle synthesis and antimalarials, free radical reactions, and stereochemistry.

Charlie's tremendous "drive" was early in evidence, for at the outset of his career at Illinois, following his speedy Ph.D. degree at Harvard, a string of experimental papers appeared bearing his name alone. There followed, quite logically, a string of students, and Charlie's many senior and Ph.D. research students are distinguishing themselves in teaching positions and in chemical industry.

The drive and inspiration of the research director reaches his students! Well-remembered by a group of us at Illinois were the uninterrupted hours of a long week-end spent at Charlie's direction supplying a crucial intermediate for an anti-malarial drug needed in the Pacific. Charlie's group had devised and developed a synthetic scheme for substituted quinolines, which was shown to be efficient and manageable during that week-end's activity and was applied later to tonnage quantities.

Along with Charlie's drive goes the attribute of originality, evident at all stages in his research work. Special mention should be made of his introduction of the concept of the cyclic sulfonium intermediate to explain the isomerization of chloropropyl sulfides, during the war-time investigation of Lewisite and mustard gas. The introduction of "foreign" end groups to aid in the study of vinyl polymerization was also an original contribution. Consider also the stimulation provided by Charlie's fresh approach to the mechanism of aromatic substitution, *cis-trans* isomerization, replacement of oxygen by sulfur in epoxides, and his contributions on covalent sulfur bonding and monomer reactivity factors. His paper at the recent International Congress in

Zurich indicates that he is invading new synthetic territory in very interesting and useful combinations of olefins with formaldehyde and amines.

Coupled with the breadth of interest evidenced in his researches is the sustained quality of his investigations. This quality is readily discernible by all who have followed his publications over an eighteen-year period. Those close to Charlie have observed his energetic tenacity even when he is trying only to satisfy his own scientific curiosity, as for example in finding the conditions favorable for the separation of acrylate polymer in regular spheres (free-flowing) rather than irregular agglomerates, an investigation successfully concluded in less than one working day.

A more appropriate example of sustained interest is found in his study of the dehydration of certain alcohols. His paper published in 1940 on this subject represented an important contribution to the stereochemistry of elimination processes, but was not one-hundred per cent conclusive. With the development of conformational analysis and the application of infrared and mass spectrometric methods during the intervening years, it became possible and desirable to return to this problem. Charlie has reported this month the completion of the reinvestigation of the dehydration process with definitive results.

The maintenance of active research programs in many fields requires memory, organizational ability, and

concentration. Stories of Charlie's ability to concentrate are numerous, and the one describing his apparent obliviousness to the hydrogen cyanide-catalyzed departure of all his laboratory mates may be fable. However, all of us have been impressed by the intensity of the thought waves he can focus on any problem.

This is one of Charlie's characteristics which has made him extremely valuable as a consultant to chemical industry. His advice has also been sought by scientific publications, and he has given generously of his time on the editorial boards of the *Journal of Polymer Science*, *Chemical Reviews*, and *Organic Syntheses*. His general interest in the development of chemistry in this country is illustrated by his founding of the Mechanisms Conference, which now has regular biennial meetings.

Finally, he has been responsible for bringing many chemist visitors to this country, giving them hospitality, and insuring that their travels in the United States result in the greatest possible scientific exchange. Thus, we express our appreciation of a man who is directing his energy full force for science and a useful life.

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**Annual Meeting:** American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa., to be held with Apparatus Exhibit, at Chalfonte-Haddon Hall, Atlantic City, N. J., June 17-22, 1956.

## Presentation to Dr. Price

THE HONOR SCROLL AWARD of the Chicago Chapter of THE AMERICAN INSTITUTE OF CHEMISTS was presented to Dr. Charles C. Price, F.A.I.C., professor of chemistry and director of the John Harrison Laboratory of Chemistry at the University of Pennsylvania, Philadelphia, Pa., at a dinner on September 30th, at the Furniture Club, Chicago, Ill.

Clifford A. Hampel, chairman of the Chapter, in his introductory remarks, said, "Lest some wonder if the multi-state definition of "Chi-cagoland," popularized by a certain local newspaper, has been expanded to include Philadelphia, let me explain that we are honoring Dr. Price for his activities in the Midwest while he was at the University of Illinois and the University of Notre Dame, both in the area encompassed by the Chicago Chapter . . . Until last fall, when he went to the University of Pennsylvania, he was a member of the Chicago Chapter, and at least twice has spoken at local chapter meetings."

Rev. Philip S. Moore, C.S.C., vice president, Academic Affairs, University of Notre Dame, prepared a paper on "Charles C. Price — Personal Glimpses," which was presented by Rev. Henry J. Bolger, head of the Department of Physics at Notre Dame.

Prof. Nelson J. Leonard, profes-

sor of chemistry, University of Illinois, spoke on "Charles C. Price — the Scientist." Mr. Hampel presented the Honor Scroll to Dr. Price, who responded with an informal talk on "The Challenge of Science." (See preceding pages.)

Preceding the dinner, a reception to Dr. Price was sponsored by Hercules Powder Company, Eli Lilly & Co., and Socony Mobil Laboratories.

The citation on the Honor Scroll reads:

To  
**Charles C. Price**

*in recognition of his professional activities as shown by his enthusiastic aid to young chemists during his teaching career; for his distinguished scientific achievements; and for his active participation and leadership in community and political organizations aimed to produce a more peaceful world.*

**FORMED:** The European Federation of Corrosion to foster collaboration in the field of research on means of protecting materials. It has two offices, one at the Societe de Chimie Industrielle, 28 rue Saint Dominique, Paris (7e), France, and the other at DECHEMA Deutsche Gesellschaft für chemisches Apparatewesen, Frankfort/M., Rheingau-Allee 25, Germany.

## Starting Salaries for Engineers

Illinois Institute of Technology, Chicago 16, Ill., reports that starting salaries for beginning engineers are still increasing. The starting pay of the 1955 June engineering graduate with the B.S. degree was \$381 per month, compared to \$363 received by the 1954 June graduate. The figure is below the all-time high of \$383 received by the 1955 January engineering class, but the difference in the size of classes and other factors account for the invariably higher starting wage received by the mid-year graduates.

**Scheduled:** The 9th National Chemical Exposition at the Public Auditorium, Cleveland, Ohio, for November 27-30, 1956, to be sponsored by the Chicago and Cleveland Sections of the American Chemical Society. Dr. Herman S. Bloch, F.A.I.C., chairman of the Chicago Section, stated that details will be announced late this summer.

**New Position:** For Dr. Robert H. Sherman, A.A.I.C., who having received the Ph.D. degree from the University of California, is now staff member of the Los Alamos Scientific Laboratory, Los Alamos, New Mexico, where he is engaged in physical chemical investigations primarily at extremely low temperatures.

**Promoted:** Howard L. Hunter, F.A.I.C., to dean of the School of Arts and Sciences of Clemson College, Clemson, S. C. He succeeds Dr. F. M. Kinard, who has become dean of the College. Dr. Hunter is chairman of the Western Carolinas Section of the American Chemical Society.

**Appointed:** Dr. Herbert E. Longenecker, F.A.I.C., as vice president of the University of Illinois, Chicago 12, Ill., effective July 1, 1955. He was formerly dean of the Graduate School and of Research in the Natural Sciences, of the University of Pittsburgh.

**Transferred:** Dr. Leonard Smidt, F.A.I.C., to the High Polymer Section, American Viscose Corporation, Research & Development Division, Marcus Hook, Pa. He was formerly technical director at Sylvan Plastics, Inc., subsidiary, in New York, N. Y.

**Honored:** Dr. Charles Allen Thomas, Hon. AIC, president of Monsanto Chemical Company, St. Louis, Mo., by The American Chemical Society with the Priestley Medal, September 12th, at the Society's national meeting in Minneapolis, Minn. Dr. Thomas spoke on "Science as a Profession and its Appeal to Youth."

# Professional Careers in Industrial Research

Dr. Mario Sealera

*Director of Research, Bound Brook Laboratories, Research Division,  
American Cyanamid Company, Bound Brook, N. J.*

(Presented as a part of a panel discussion on "The Facts of Life for Chemists," at a meeting of the New Jersey Chapter, AIC, at Rutgers University, New Brunswick, N. J., December 1, 1955.)

I HAVE BEEN asked to present industry's side of the research story . . . I have lived my life in an age teeming with the accomplishments of this industrial research; accomplishments that represent a monument so imposing, nay, so inspiring, that no one who has been a part of them can fail to swell with pride at his association. I address myself to the human balance sheet of industrial research; not to the problems it has solved, but to the lot of the men it uses in solving them. Specifically, I speak of the lot of these in terms of their scientific stature, their professional dignity, their joy and pride in their work. And I am well aware that these have often been challenged; perhaps more in ignorance than in knowledge, but none the less challenged by voices that have claim to authority. Nevertheless, I speak on the subject with no hint of apology.

I would do less than justice to you, many who look forward to professional careers in industry, and to the sponsoring organizations that have so stoutly defended your professional status, if I mentioned only the high salaries, the job security, the fine

physical plants, and the many other material advantages of industrial careers. For real though these be, they are not cognate to the issue. The issue is this: Can a man remain a professional scientist, and grow and progress in an industrial research laboratory?

Industrial research is the meeting ground, the mating, and the offspring of two very diverse but not incompatible entities; the *industrial enterprise* and the *scientific profession*. I shall define each in turn, particularly in terms of their objectives.

(1) **Industrial Enterprise:** The primary objective of all industrial enterprise is profit, any pronouncement by Marxist doctrine to the contrary notwithstanding. This profit objective may be long range; today's profits may be sacrificed for newer plants, for higher quality standards, for better working conditions, for more research, for community relations. But they are so sacrificed in the hope and belief that this will bring even greater profits tomorrow. This is the reason why stockholders put their savings in industry, and managements would fail of their prime responsibil-

ity as faithful stewards if they did not serve the interests of their owners. But to stop there would be to do vast injustice to industrial enterprise. For would any of you for a minute believe that the sustained effort, the burning of the midnight oil, the sacrifice of life and frivolous pleasures of such men as Henry Ford, or Dr. Baekeland or Willard Dow were solely for the purpose of accumulating wealth? No, that would be a blind view indeed. In the creation of vast enterprise these men surely found food for their spirit as well as for their belly; and in the pride of their contribution to society's, to America's, and to the world's progress they found a reward far exceeding the millions they accumulated. Therefore, it is certainly true to say that a secondary but highly significant objective of industrial enterprise is service. If its products or its function cease to be of real service and value to the community, that enterprise in time will cease to exist, for it would not be able, by lure of profit alone, to attract the caliber of men it would need to survive.

(2) **Profession:** The primary objective of a profession is service; service that requires a high degree of intellectual skill and specialized knowledge. Hence, the prime reward of the professional is pride in the caliber of his service, and the recognition that comes to him, both from his fellow professionals and from the world at large, because of his singular contributions. The secondary objective of a profession is profit, for while man does not live by bread alone, he must nevertheless eat; and it is no shame to desire that which money can buy, and the security that money can give, for one's self and one's dear ones, wife, children and kin.

These two entities, therefore, have the same objectives in common, but their order of importance is reversed in the two. In the modern research departments of industry, these two are thrown together in intimate contact. Can they continue to exist together, or must one completely overshadow the other? To be specific, must the managers of an enterprise which is highly dependent on science and technology, such as the chemical industry, have to give up their primary objective, the profit motive, in order to properly discharge their function? Obviously not. And conversely, do those scientists who are no longer independent professionals, but who are employed full time by such industries, have to give up any of their professional prerogatives in order to be valuable employees? Again, fully and emphatically, no!

Let me recognize that there are definitely some grounds for misunderstanding and some conflicts, as one could well surmise when two entities so diverse meet on common ground.

Let me quote two common conflicts which originate from errors on the part of management:

## PROFESSIONAL CAREERS . . .

(1) Service, to be truly professional, must require a high degree of intellectual skill, and must be truly challenging to the mind. To illustrate, let us suppose that a very wealthy man with a very sensitive skin were to approach an eminent dermatologist and ask him to shave him every morning for \$50. a shave. Even though the reward is high, I am certain that the dermatologist would give a reply in unprintable words. Similarly, when management requires a chemist or a chemical engineer to perform a job that a clerk or a dishwasher could do, regardless of how useful the job itself may be, and regardless of the salary paid, the scientist has a right to resent it, and usually does, as an infringement on his professional stature. Even if he does not openly object, he grumbles and is unhappy and a conflict exists.

(2) The professional cannot render his best service outside of the atmosphere of his profession. This atmosphere is natural in a lawyer's book-lined office or in a doctor's private clinic; but it often seemed out of place to management in its first contacts with professional employees. I am not here referring to a physical atmosphere, fine equipment, comfortable and efficient laboratories, adequate library facilities, etc. These are only the tools of the trade. You can actually have a greater atmosphere of professionalism in the primitively equipped and dingy laboratory of a free-lance inventor than in the show-

place surroundings of certain industrial laboratories built to impress financial backers. The atmosphere I refer to is not of things built by human hands but is in the very air. It is nurtured by freedom to discuss freely the results of one's investigations both within and without the laboratory walls; it is enhanced by freedom to attend scientific meetings and to publish in scientific journals; it is created by freedom from petty rules, which may be essential with clerical or production workers but are incompatible with professionalism, such as punching of time clocks or keeping close tabs on the scientist's time spent talking at the lunch table, or in the hallway or smokeroom bull sessions. When this atmosphere is lacking, as unfortunately it has been at times in industrial laboratories, the professional feels constrained, frustrated, regimented: A conflict is created!

Some conflicts arise from errors on the part of the professional:

(1) The primary objective of a profession, as stated before, is service. This means satisfying the needs of your client in the most direct and expeditious manner possible. Assume for a moment that you have a wart on your hand, and you go to a doctor to have it removed. If the doctor offers to remove it by prolonged and expensive treatment using a new radioactive ointment, instead of just cutting it out, you would resent it and feel that he is taking advantage of

you. Similarly, many research scientists in industry delve into lengthy theoretical investigations purely to satisfy their own curiosity, knowing full well that these will be of no value whatever to their employer. This is very definitely unprofessional behavior, as it serves not the best interest of the client, but the whim and pleasure of the professional. Management resents it rightly and a conflict is created. This should not be construed as my disapproving of all fundamental investigations; often they are the only means by which a problem can be understood and solved, and they can be of real dollars and cents service to the employee. But the touchstone, the acid test, should always be that of service: Does this satisfy my client's needs in the best possible manner?

(2) A professional is basically an adviser and not a manager. Thus a doctor can advise you to have an operation performed, but he cannot perform it without your permission. A lawyer can counsel you to sue at the law, but he cannot order you to do so. Similarly, a professional scientist can and should advise management on a new product to market, or a new process to displace an old one; but he cannot and should not expect to take over the functions of management and make the decisions. You must remember that the basic responsibility for the investment of capital remains with management.

Conversely, when a professional scientist does become a part of management he ceases to be a professional and must acquire the profit motive as his prime obligation, nor continue to expect the atmosphere and other prerogatives of pure professionalism. It is often because a scientist insists on wearing two hats that conflicts arise.

In conclusion, what does a scientist, just leaving the academic halls and the purely professional air of a university, have a right to expect as he ventures into an industrial career? He has the right to expect four things, and today he can find all four of them if he earnestly seeks them.

(1) A financial reward and financial security commensurate with his value to the company.

(2) A task fully challenging to his scientific training.

(3) An atmosphere congenial to his professional thinking.

(4) An opportunity to grow to the fullest extent of his talents, along either managerial or professional lines according to his free choice.

I wish to stress this last point particularly, for I have found it to be the one of greatest interest, and greatest concern, to the hundreds of young scientists whom I have interviewed in my industrial career. It is natural for an ambitious young man to want to grow to the fullest extent of his abilities. All too often, however, young scientists believe that

there is only one way to grow in industry, and that is up the supervisory and managerial ladder. This, they realize, means gradually losing one's professional and scientific standing, and shouldering a greater burden of administrative duties. Now to some young men this is a stimulating challenge and a coveted choice. To others, however, who find in the quest of truth, in the solution of baffling problems, in the free air of scientific argument, a joy and zest unequalled in any other pursuit, the choice is a hard one. For they believe that in order to pursue this stimulating vocation they must renounce at least the prestige, the recognition and the stature, and perhaps also the material rewards, which come with promotion. This should not be so, and young scientists have a right to expect that it be not so. My company, and we are not alone in this respect, recognizes scientific and professional growth as a path of progress entirely parallel to supervisory and managerial growth. And this parallelism is recognized by us not merely in salary scales, but in titles, prestige and privileges. In this system there are two pathways of growth; the one increases the administrative, personnel and budgetary responsibilities of the growing young man; the second increases his scientific independence, his planning responsibilities, and his expected contributions to new avenues and new areas of research. In such a system

a young man has a true choice, with growth and recognition beckoning in each; on the one side growth in the handling of men, on the other growth in the solution of the scientific problems of industry. By such a system, we feel, born leaders of men need not neglect this talent in their lone search for truth; nor will brilliant scientists have to sit behind a desk forcing their reluctant minds to cope with wage scales or union contracts.

This is what the field of industrial research has to offer to its scientists, who form the lifeblood of its laboratories and without whom our imposing structures and our expensive equipment would be empty skeletons without life or value. What do we expect in return? First, an understanding of our objective, which is profitable operation of our company; and second, a devoted service to that objective with the full skill and technology you have learned. And, this you will agree, is not a request in any way incompatible with professional standing.



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# What the Research Executive Does as an Avocation

E. M. Bryman and Maurice Holland

*Research Associate and Industrial Research Adviser, 60 East 42nd St.,  
New York 17, N. Y.*

(A survey of hobbies, based on questionnaire-replies from leading science and technical executives of nationally known industrial companies. Samples taken from membership of Industrial Research Institute.)

THE PURPOSE of this survey is an attempt to draw a "composite picture" of the research executive as a social entity. From his hobbies or extracurricula activities — which motivate from impulse and not from necessity to earn his daily bread — we get a glimpse of how this scientist "ticks."

Such a composite picture of the man, free to follow his bent whether social, cultural or altruistic, may serve as inspiration for others to embark upon the hobby they "one day hoped to find time for" and thus attain a full measure of enjoyment in their leisure hours.

## Highlights of Findings

The cooperating respondents comprise a goodly representation (one-half of the total membership) and since "half a picture is better than none," we present our findings within these limitations.

Of the 128 members to whom questionnaires were mailed, 64 responded. They generously supplied the information we requested, and in some cases elaborated on their hob-

bies or special fields of recreation.

Emphasis by most respondents was on "the urge to get outdoors and engage in some physical exercise to relieve the tension." The need for change of pace from mental stimulus was instinctive! "Some thing to do with my hands" was the expression many used.

A quick view of the composite picture impresses us that the research executive is the "rugged outdoor type" seeking recreation and diversion for the sheer enjoyment he gets out of it — thus exploding the myth that he is an "ivory tower hermit."

On further analysis we find that many scientific and technical men find outlet in intellectual and cultural hobbies. Inspiration (from the spirit of Omar Khayyam perhaps) might even be found in the extra-curricula pastimes of two respondents who reported "wine bibbing" and "loafing" as most enjoyable.

## Categories of Major Interest

Our findings disclose a list of 75 hobbies. Subjects run from golf and fishing, gardening and shopwork, to

the more serious intellectual and cultural pursuits.

The data collected on these hobbies and analyzed appears to fall into three major categories of interest: (1) Physical and Manual, Outdoors mainly. (2) Photography and Travel. (3) Intellectual and Cultural. The subjects and findings are indicated in order of preference.

#### Physical and Manual

**Subjects:** Gardening, Flowers (wild roses, orchids), Lawn culture, Farming (dairy, soil conservation, animal husbandry). Respondents, 37. *Reasons for choice:* Urge to get back to Nature." Love to see things grow. Love of flowers. Outdoor relaxation. Creative. Long standing interest. Brought up on farm. Experimental. Basic urge for city-bred man to get back to rural living.

**Subjects:** Shopwork, Woodworking, Metal Working, Cabinet making, Carpentry, Repairs (summer cottage), Precision machine tool. Respondents, 23. *Reasons for choice:* Outlet for creative work. Increase manual dexterity. Relieves tension. Raised that way. Like to do things with hands.

**Subjects:** Design and construction of motor boats, HO model RR, model houses, or music systems. Respondents, 4. *Reasons for choice:* Interest in high speed equipment. Enjoy making things. Interested in good music.

**Subjects:** Golf, Fishing (trout), Boating and sailing, Skiing and skating, Hiking and mountain climbing, Hunting, Swimming, Tennis, Camping, Helmet diving, Flyrod making and Fly tying. Respondents, 54. *Reasons for some choices:* Love of outdoor sports. Relaxation, no mental effort. Secluded changing environment. Good Health. Outdoor exercise. Love woods. Love water.

**Subjects:** Bridge, Poker, Chess, Pool, Bowling. Respondents, 8. *Reasons for choices:* Mental stimulation; fun. Social. Psychological interest in people.

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#### Photography and Travel

Because of the great popular appeal for Photography and Travel, we have followed the lead of these enthusiastic respondents by coupling the subjects for reasons given below:

**Subjects:** Photography, (emphasis on color). Respondents, 18. *Reasons given by some:* Record of travels (given by many). Creative self-expression. Inventive. Opens eyes to Nature's beauties. Urges one to go places, see things. Absorption in outdoors, can't be matched. Supplements eyesight in high speed work. Increases family pleasure. Serves as introduction to fellow-travelers.

**Subjects:** Travel. Respondents, 10. *Reasons given by some:* Curiosity to see other people and places. Stimulates thinking. Improves perspective.

#### Intellectual and Cultural

Focusing attention next on the "aesthetic" characteristics of the research executive, he expresses in his hobbies an inherent love of music, particularly for piano, organ, records and singing. Even a composer can be found in his midst.

About the same number of men are absorbed in literature, the arts and the sciences. There are also the collectors of stamps, maps, and books;

the public-spirited and humanitarian who devote their leisure hours to civic affairs, family life, and animal life.

Endless talent and genius abound in the individual listings. Many unique hobbies are among them; they rate special mention even though one listing may be limited to only one man's hobby.

There is the philosopher and naturalist who studies "man's thinking processes"; the psychologist who learns more about people while enjoying his game of poker; the "romantic" who gets a lift out of poetry and fiction; the practical-minded who studies the stock market and finds it profitable! And there are the creative, constructive executives who find the time to build motor boats and race them; and others who build model railroads and model houses, and music systems!

**Subjects:** Music, records, organ, piano, singing, composition, magnetic recording. Respondents, 20. *Some reasons given for choice:* Inherent love. Pleasure. Relaxation. Mother's influence. Natural inclination. Keep son's interest in music.

**Subjects:** Painting, portrait. Sculpture. Respondents, 4. *Reasons:* Natural talent or inclination.

**Subjects:** Literature and the Sciences: Reading, Poetry, Public Speaking, Economics, History of chemistry, History — local, Genealogy, Mathematics, Stock Market, Philosophy, Nature, Creative Thinking, Short-wave radio. Respondents, 20. *Reasons for some choices:* Hobbies help maintain sense of proportion. Pleasure. Overcome inferiority complex. Unusual family name. Helps business judgment.

**Subjects:** Civic, Community Service, Professional services. Respondents, 5. **Reasons:** Enjoy busy tempo. Meet non-technical people. Desire to serve mankind.

**Subjects:** Animal life. Dog raising, miniature poodles, Bird census and study, Poultry raising, Tropical fish. Respondents, 2. *Reason:* Outdoor interest.

**Subjects:** Family life. Son's hobbies, Boys' baseball, pony leagues. Respondents, 2. *Reason:* Family pleasure.

**Subjects:** Ceramics, Charcoal conkery, Handicrafts, Weaving, Gunsmithing, Loafing, Wine bibbing. Respondents, 7. *Reasons:* Develop artistic sense. Pleasure. Natural aptitude.

### Why Are Hobbies Chosen?

To assist the research executive in defining the motivating reasons as to why he chose his hobby, we suggested the following questions and report their answers here:

*Does your hobby provide opportunity for incubation of problems re your professional work?* 55% replied "No"; 36% replied "Yes." 9% did not know.

*Does your hobby provide relaxation and freedom from pressing problems?* 93% replied "Yes"; 7% replied "No."

### Summary

From the foregoing analysis it is apparent that research executives seek in their hobbies some form of physical or intellectual diversion as a relief from the pressure of their daily occupation.

While it was not our intention to interpret the results of our findings but rather to attempt to find a clue

as to what makes the research executive "tick," the data collected and analyzed reveals a reservoir of talent and ingenuity which might well be tapped for the benefit of their professional affiliations.

By the very nature of their professions research executives are "creative thinkers." Their intellectual curiosity obviously goes beyond laboratory walls if one is to judge from the intriguing lists of hobbies found in this survey.

Who can tell but what one man's idea, inconsequential for the moment yet so sound in principle, may be the bridge to an interesting business which will keep him happily occupied in his more leisurely days of retirement — all of which had its beginning in One Man's Hobby!

**Appointed:** Dr. A. G. Hill, F.A.I.C., as resident technical director for the Organic Chemicals Division of American Cyanamid Company, at Bound Brook, N. J. He will also act as development manager for Intermediates produced by the Division. He was formerly technical director for the Intermediate and Rubber Chemicals Department.

Appointed as development managers for the Technical Department of the Organic Chemicals Division were Dr. R. H. Ebel, F.A.I.C. (Rubber Chemicals), and Dr. W. P. Munro, F.A.I.C. (Vat Dyes and Vat Dye Intermediates).

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**Question:** "Where will scientific genius carry us?" Dr. Albert C. Jacobs, president of Trinity College, speaking at the commencement exercises of Polytechnic Institute of Brooklyn, Brooklyn, N. Y., posed the query. His answer: "Scientific progress must continually go forward. Science and research add immeasurably to human welfare and to our knowledge of the universe. But science does not teach us how to use this ever-expanding knowledge for the betterment of mankind. . . . The love of God and neighbor can and will point the way out of the world's difficulties. . . . Science has not outdistanced morality and spirituality. It has only given rise to the absolute necessity for putting into effect God's teaching."

**Appointed:** Dr. Robert W. Schiessler, F.A.I.C., as technical director of the research and development laboratories of Socony Mobil Oil Co., Paulsboro, N. J. He was formerly associate professor of chemistry at Pennsylvania State University.



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## AIC Activities

### Chicago Chapter

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A. Bjorksten*

### Management, Morale and the Professional Man

*At the November 11th meeting of the  
Chicago Chapter, Dr. Burleigh B. Gardner,  
executive director of Social Research,*

*Inc., spoke on "Management, Morale and  
the Professional Man."*

*In the January issue of the Chapter's  
Newsletter, the following excerpts from  
Dr. Gardner's talk appear:*

*Dr. Gardner pointed out that studies on  
the professional personnel have shown poor  
morale and internal friction which are not  
conducive to creative work. The profes-  
sional man very often feels trapped in an  
organization which does not make good  
use of his talents and which stifles rather  
than encourages individual growth or  
creative thinking. Dr. Gardner explained  
that in many types of organizations the  
highest trained professional people were  
extremely critical of the organization and  
its management. Many types were enum-  
erated, such as doctors, research men, engi-  
neers, airline pilots, etc. The hostile at-*

## AIC ACTIVITIES

titudes and feelings of these types were very similar.

The speaker pointed out that management in dealing with the critical attitudes of the professional often feels that these men are hard to get along with and that these men put their own interests ahead of the needs of the organization.

The professionals who gripe are also seen in organizations where morale is good. In many instances the shop morale is higher than the professional. The administrative policies which develop good morale in certain sections in an organization seem inadequate for solving the basic problems of the technical man.

Dr. Gardner believes that part of this problem arises because of the nature of the professional man himself. The professional is strongly interested and motivated by his chosen field. The most important recognition for the professional is by his colleagues and professional leaders rather than his boss or the company. Dr. Gardner further explained that studies have shown that the professional men are not identified with the company as the average executives are.

The constant sources of difficulty generally arise when the promotion of a research man to an administrative position is made or when the young graduate starts his first job and adjustments are being made.

Dr. Gardner concluded his talk by saying that unless management learns how to fit the professional men into organizations which can bring out and utilize their creative skills, these problems will always exist. Unless the professional men can find satisfaction in their being a part of such an organization, constant rebellion will exist.

### Washington Chapter

*President, Paul E. Reichardt*

*Vice President, John Williams*

*Treasurer, Albert F. Parks*

*Secretary, T. Allan Davis, 1016 Urell Place, N.E., Washington 17, D. C.*

*National Council Representative, P. E. Reichardt*

### Chemicals and Tariffs

At the December 13th meeting of the Washington Chapter, Theodore S. Hodgins, director of Chemical & Rubber Division, Business and Defense Services

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Administration, U. S. Department of Commerce, spoke on "Business and Defense Service Administration's Role in Present Tariff Negotiations in the Chemical Field." He covered such topics as GATT (General Agreement on Tariffs and Trade), its background and purpose, bilateral and multilateral agreements; and present negotiations on 15 per cent reduction of current U. S. Tariff rates at 5 per cent for 3 years, including amount of foreign trade involved and necessity of selectivity of items or commodities for tariff reduction. It was in the latter field that BDSA endeavored to concentrate its contributions by pointing out the significance of individual items to the health and well-being of the country, to the military and to the economy of this country and particularly to the chemical industry. Many factors had to be gathered and considered, such as U. S. production capacity, completion of expansion goals, current and expected production, manpower, and skills required, extent of research and development for the military and foreign competitors and developments. Then the other side of the picture, namely, U. S. requests for tariff concessions on specific items or groups of items, by member nations of GATT, was covered briefly.

### Underground Storage of Natural Gas

On November 8th, the Chapter met at luncheon to hear a talk on "Developments in Underground Storage of Natural Gas in the Washington, D. C. Area" by Paul E. Reichardt.

The cost of natural gas delivered to Washington Gas Light Company is probably the main incentive for underground storage. The cost is based on two factors; (1) commodity charge and (2) demand

charge, the latter calculated on the maximum daily demand during the year. Underground storage of gas would lower the demand charge and thus lower the total cost.

The speaker covered liquefaction and storage of natural gas, and the use of mined caverns (salt or rock), depleted oil and gas fields, and suitable water-sands for underground storage.

In the Washington, D. C., area, surveys were made for closed water-sand anticlines with impervious cap rock. These entailed collection of water-well data, and magnetic and gravimeter surveys. The sand must be porous enough to allow pumping the gas in and withdrawing it as needed. Porosity of 10-15 per cent is considered satisfactory. The methods of drilling and sampling were explained briefly.

Mr. Reichardt announced that Dr. Richard L. Kenyon, of the American Chemical Society, has accepted the chairmanship of the Honor Award Committee. The award presentation is expected to be made in March or April.

An intangible but noteworthy aspect of this meeting was the expression, by many members present, concerning the relaxed atmosphere and good fellowship.

## Opportunities

Doris Eager, M.A.I.C.

AIC members who are seeking positions may place notices in this column without charge.

### Chemists Available

**Literature chemist**, experienced library supervisor in foods, petroleum, and editor of well-known bulletin of abstracts on petroleum research, desires responsible position, preferably technical writer, editor, abstractor, public relations. Box 10, THE CHEMIST.

**Research and Development Direction**: Ph.D., 17 years in industrial organic, biophysics and chemical engineering. Foods, pharmaceuticals and sanitary chemicals. Patents and publications. Age 37. Box 12, THE CHEMIST.

**Chemist, F.A.I.C., B.S. 1940.** Research & Development; plasticizers and polymers, metal surface coatings, (inorganic); rare and semi-rare metals. Supervisory in metal finishing and laboratory. Lithium, tungsten, titanium, zirconium salts, in laboratory and plant. Box 14, THE CHEMIST.

### Positions Available

**Ph.D. Chemistry.** Age 30-35. Experience: Cereal Chemistry, Fermentation processes and by-products, with specialization in a field such as nutrition (human and animal), pharmaceuticals or microbiology. Salary \$12-\$15,000. Location mid-west. Box 11, THE CHEMIST.

**Washington Representative** to take charge of contracts and maintain a working relationship with government agencies. Age 35-45. Chemical background and experience in government contract negotiations necessary. Salary in \$15,000 range. Box 13, THE CHEMIST.

As a result of expansion and new plant construction, the following positions at the department head level are now open:

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**No. 3.** Chemical Engineer or Mechanical Engineer who will be responsible for a process design and cost estimating group engaged in guiding development work in the manufacture and spinning of new fibers.

Please address inquiries or send resumes to Personnel Development, Inc., 122 East 42nd St., New York 17, N. Y. (This is a management consulting firm. There is no fee to applicants.)

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### Will You Come

**Jan. 10, 1956.** Washington Chapter. Luncheon, O'Donnell's Sea Gt'l, Washington, D. C. Speaker: John F. Williams, F.A.I.C., Chief, Division of Technical Services, U. S. Bureau of Customs, "Problems of a Customs Chemist."

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**Jan 13, 1956.** Chicago Chapter. Engineers Club, Chicago, Ill. Dinner. Speaker: Mrs. Ethaline Cortelyou, Technical Report Editor, Chemistry Dept., Armour Research Foundation. Subject: "Utilizing Chemical Woman-Power." **Feb. 8, 1956.** National Council and Board of Directors of The American Institute of Chemists. Meeting, Akron, Ohio.

**Feb. 10, 1956.** New York Chapter. Joint meeting with American Chemical Society. Dinner. 6:00 p.m. Carbide & Carbon Cafeteria, 30 E. 42nd St., New York, N. Y. Panel Symposium: "High School Science Teacher Scarcity — a Nationwide Dilemma." Introduction: Dr. Hubert Alyea of Princeton University. Speaker: Samuel Schenberg, Supervisor of Science for the Board of Education of the City of New York. Panel Groups: (1) Industrial Employers who have hired science teachers for summer laboratory positions: Karl M. Herstein, President, Herstein Laboratories; Dr. C. L. Wrenshall, Director, Technical Services, Chas. Pfizer & Co., and R. V. Worthington, Industrial Relations Adviser, Technical Service Department, Socony Mobil Oil Co. (2) High School Science Teachers who were employed last summer in industrial positions: Sidney P. Harris, Herbert Tucker, William Clarvit. Moderator, Prof. Alyea. For information: Shepherd Stigman, Foster D. Snell, Inc., 29 W. 15th St., New York 11, N. Y. (WA 4-8800).

**Feb. 17, 1956.** Chicago Chapter. Dinner. Engineers Club. Award of AIC Honorary Membership to Dr. Roy C. Newton, F.A.I.C., vice president in charge of research, Swift & Company. Speakers: Dr. Gail Dack, head, Depart-

ment Bacteriology, University of Chicago, and head of the Food Research Institute; and Harold S. Mitchell, formerly director of the Laboratories of Swift & Company. For information: H. F. Schwarz, c/o The Sherwin-Williams Co., 11541 So. Champlain Ave., Chicago 28, Ill.

**March 26, 1956.** New Jersey Chapter. Visit to Picatinny Arsenal.

**April 1956.** (Date to be announced.) New England Chapter. Dinner. Award of Honor Scroll and Student Medals.

**April 26, 1956.** New York Chapter. Theme: "So You're Going to be a Chemist." Student Medal Awards.

**May 3, 1956.** New Jersey Chapter. Presentation of Honor Scroll. Newark, N. J.

**May 9, 1956.** National AIC Council and Board of Directors. Dinner Meeting. Statler Hotel, Boston, Mass.

**May 9-11, 1956.** Annual Meeting of The American Institute of Chemists. Hotel Statler, Boston, Mass. Theme, "The Chemist Looks at Communications." Award of 1956 Gold Medal to Raymond Stevens. The New England Chapter will be our host.

**June 7, 1956.** New York Chapter. Annual Dinner Meeting. Hotel Commodore, New York, N. Y. Honor Scroll Presentation.

**May 1957.** (Date to be announced.) AIC Annual Meeting. Akron-Cleveland area, Ohio.

## For Your Library

### Organic Analysis

*Vol. I. Edited by John Mitchell, Jr., J. M. Kolthoff, E. S. Proskauer, and A. Weissberger. Interscience Publishers, Inc. 473 pp. \$8.50.*

In order to acquaint chemists, both in the teaching field and in industry, with reliable and critical information about new methods and procedures for the analysis of organic systems, this annual series will stress new developments in research and emphasize functional group analysis and instrumental techniques.

The series is also intended to fill the gap for the student, between his theoretical university training in quantitative analysis (with its emphasis on gravimetric and volumetric procedures) and the prac-

tical field of organic quantitative non-elemental analysis which is of such great importance to industrial organic and analytical chemists.

This volume covers the following topics: Determination of Hydroxyl Group; Determination of Alkoxy Groups; Determination of Alpha-Epoxy Group; Organometallic Compounds for Determination of Active Hydrogen; Diazomethane for Determination of Active Hydrogen; Determination of Carbonyl Compounds; Determination of Acetals; Determination of Organic Sulfur Groups; Spectroscopic Functional Group Analysis in the Petroleum Industry.

Graphs and figures and a subject index add to the usefulness of this book.

—DR. FREDERICK A. HESSEL, F.A.I.C.

### Bulletin of the Research Council of Israel

*Vol. IV. October 1954. Interscience Publishers. 9-1/2" x 6-3/4". \$5.50 per volume (one volume per year).*

This is a quarterly journal containing original articles, brief communications, and proceedings of Israel's scientific societies. All parts of the journal are in English. The present issue, dedicated to the 70th birthday of Prof. Andor Fodor, contains numerous papers of physical inorganic, organic, and biochemical nature. Prof. Fodor taught biochemistry at the Hebrew University at Jerusalem for thirty years. This valuable journal should be available in all chemistry libraries.

—DR. HENRY TAUBE, F.A.I.C.

### New Methods in Analytical Chemistry

*By Ronald Belcher and Cecil L. Wilson. Reinhold Publishing Corp. 1955. 286 pp. 5-3/4" x 8-3/4". \$5.50.*

Covering a large number of the new methods in analytical chemistry which are based on the classical techniques of the art, this book complements that published by A. D. Mitchell and A. U. Ward in 1932 and will undoubtedly prove as much of a boon to analytical chemists. Here they will find the new methods, developed since the date of the Mitchell & Ward book, which have not yet reached the standard textbooks and are not generally accessible. The authors do not pretend to have tested every method described

or to have covered every single one that has been developed, but they have included a large number of methods which the average researcher would have a hard time locating in the literature.

The uniform mode of presentation used, wherever possible, is to refer first to previous methods, where relevant, and to give the important properties of the reagent described. The compound formed or the properties of the reagent involved is included where known, together with any special properties influencing its analytical behavior. Optimum conditions are discussed; ions which do or do not interfere and the occurrence and avoidance of unfavorable conditions are detailed as well as final treatment of the product. Following this overall discussion comes the experimental procedure recommended. If an unusual reagent is proposed its synthesis is indicated, if possible.

While all methods do not lend themselves to this sort of presentation, as is the case in the chapter on indicators, the authors have maintained a remarkable uniformity in their treatment of these complicated techniques.

Author and subject indices make this an easy book to use as a reference.

—Dr. Frederick A. Hessel, F.A.I.C.

### Chemical Process Principles

*Part 1. Second Edition. Material and Energy Balances.* By Hougen, Watson & Ragatz. John Wiley & Sons, Inc. 530 pp. 6" x 9". \$8.50.

This volume is devoted to physico-chemical process problems and their solution. The mathematics is simple and the treatment of processes mainly empirical, clear, and direct. Thermal relationships are stressed. The book is of practical value.

—DR. JOHN A. STEFFENS, F.A.I.C.

### Chemical Books Abroad

#### Rudolph Seiden, F.A.I.C.

Edictio Cantor, Aulendorf i. Württ.: *Biochemie, Physiologie und Klinik der Glutaminsäure*, by V. Klingmueller. 1955; 312 pp. (21 ill., 47 tables); DM 32. — This timely monograph includes all that is known today about glutamic acid, its properties, preparation, occur-

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rence, biochemistry, physiological chemistry, medical indications, and uses in psychiatry. The work is based on the author's own wide experience with this most important amino acid; it also includes an extensive bibliography (over 2,400 references to 1955).

Geest & Portig, Leipzig: *Die technische Elektrolyse im Schmelzfluss*; 2nd ed., 720 pp. (224 ill.); DM 56. — This is volume 3 of the "Handbuch der technischen Elektrochemie" by G. Eger; it deals with the technical methods of electrolysis of Al; Mg and its alloys; Ca, Sr, Ba; Na, K, Li, Ru, Cs; Be; heavy metals and cerite metals. This informative book was written by 14 European electrometallurgical experts.

Springer-Verlag, Berlin W 35: *Polystyrol*, Vol. 1, by H. Ohlinger; 1955, 155 pp. (22 ill.); DM 19.80. — From ethyl benzene, monomeric styrene is produced which can be transformed to polystyrene. Various production methods are discussed in detail, emphasis being placed on the modern polymerization methods. • *Die chemische Bindung*, by H. Hartmann; 1955, 105 pp. (57 ill.); paperbound DM 9.80. — Three lectures on the modern aspects of the chemical bonds.

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Walter de Gruyter & Co., Berlin. *Pharmaceutisches Woerterbuch*, by C. Hunnius. 2nd ed. 610 pp. (\$0 ill., 16 tables); DM 18.50. — The first edition of this dictionary was reviewed in the November, 1951, issue of THE CHEMIST; the new edition reflects the remarkable growth of the German pharmaceutical-chemical industry in the last 5 years. Hundreds of new key words have been added; the articles on paper chromatography, poisons, hypnotics, ferments, hormones, vitamins, sulfonamides, etc. have been brought up to date; and the appendix has been enlarged by the inclusion of complementary new tables. • *Woerterbuch der physiologischen Chemie*, by H. Dyckerhoff. 1955, 175 pp.; DM 18.50. — Brief definitions of physiological processes and of chemicals which participate in them; written primarily for busy physicians, but also for chemists and other scientists.

Georg Thieme Verlag, Leipzig C 1: *Grundriss der organischen Chemie*, by Oppenheimer, Naegeli, Neunhoeffer, and Metze. 17th ed., 328 pp.; DM 14.50. — It is noteworthy that the name of the original author of this outstanding textbook of organic chemistry, Prof. Carl Oppenheimer, has been reinstated and appears now together with the names of those who have revised it. "Oppenheimer" is probably still the most comprehensive work of its kind — a quality for which it was known to generations of German-speaking chemistry students.

Hippocrates Verlag, Stuttgart 1: *Die Ordnung unserer Nahrung*, by W. Kollath; 4th ed. 276 pp.; paperbound DM 14.50. — A strong appeal to make grain, milk, and other natural foods the basis of nutrition and to make the foods free of nutritional deficiencies by (1) improving agricultural methods and (2) using better methods in the preparation of foods in the kitchen.

## Communications

### The Prometheus

To the Editor:

Dr. Makara's letter (THE CHEMIST, December 1955, p. 462) hits the chemist right where it hurts the most — his professional ego, when he suggests that chemists "enter into contracts calling for a minimum weekly wage plus a percentage of the profits of the invention."

Dr. Makara is in effect asking that the sheep hunt with the lions. Chemists are a timid lot. Most would be frightened to death at the idea of working for an indefinite annual income. Others would be paralyzed by anxiety if their annual income depended on their creativity.

What I have found most common among my confreres is an infinite capacity to find fault with their status but an infinitesimal capacity to place the responsibility where it belongs—on their shoulders.

The industrial chemist is charged with the responsibility of creating new wealth and power! What a role to play! Yet this Prometheus pleads, in effect, with his employer to be a little more generous with him; to treat him with more respect and, if the market permits, to pay him a few more dollars!

—Dr. William I. Harber, F.A.I.C.  
Chicago, Illinois

**Gracious Comments**

To the Editor:

The Inspector of Colleges and High Schools under the jurisdiction of our teaching organization asks if he could be granted permission to include "For More and Better Chemists" (THE CHEMIST, August, 1955) in the forthcoming issue of "The Marianist Educator" . . . It is the Inspector's thought that some of the spirit and ideas advanced in the article might strike root. He was gracious in his comments on the presentation of the subject . . .

—Dr. William J. Wohlleben, F.A.I.C.  
Dayton, Ohio

**Pleased**

To the Editor:

Enclosed is our ad for the January issue of THE CHEMIST. We are very pleased with things so far. Keep up the good work.

—William E. Phillips, Inc.  
Chicago, Ill.

## Chemists Licensed in The Philippines

To the Secretary:

You may be interested to know that this country (The Philippines) requires chemists to be licensed according to law before practicing in public, just like the medical, law, and other professions so regulated by the state.

—Miguel G. Ampil, *Executive Secretary*  
Chemical Society of the Philippines

## Impressed

To the Editor:

We were very impressed with the talk (by Dr. Hass) on creativity. We publish a monthly house organ . . . We would very much like to quote from (this speech) . . .

—Solar Light Manufacturing Co.,  
Chicago, Ill.

## Well Done

To the Editor:

We thought the December edition featuring Dr. Hass' Honor Scroll Award was exceptionally well done. . . .

—Gar Schmitt

## Prophetic Paragraphs

The big problem of today is energy . . . So long as atoms were considered the ultimate unit and the smallest conceivable subdivision of matter no one thought of possibly deriving more energy than is to be had by the step from the molecule to the atom.

But this is changing. Through research on atomic structure and experiments with apparatus but lately available we have come to know that the atom is composed of many parts, some going so far as to say that all matter, all elements, iron, copper, gold, etc., are made from the same stuff, the difference being in the number, arrangement and movement of these particles which go to make the atoms.

Scientists believe that from atomic dissociation could be derived such vast quantities of energy that our whole civilization would be changed, and one of them has said that man will some day date his accomplishments from the discovery of how to use the energy bound up in the atom.

—Harrison E. Howe  
*The N. Y. Herald*,  
Sept. 25, 1921



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**Golden Anniversary:** This year marks the golden anniversary of the coming of Dr. Alexander Silverman, Hon. AIC, to the University of Pittsburgh, Pittsburgh, Pa., as a member of the full-time staff of the Chemistry Department. The College, and the Graduate School. A special striking of the Francis Clifford Phillips Medal in Chemistry was presented to him, at the Commencement program of the University, by Dr. Henry S. Frank, present head of the Chemistry Department, who said:

"This special striking of the Phillips Medal has been authorized in recognition of your long, faithful, inspiring, and efficient service as chemist, as teacher, as administrator in the Chemistry Department of the University. Today you complete fifty college years in the University from your instructorship through your current emeritus professorship. We hope that you will remain with us many additional years as an example and an inspiration to others in the faculty and student body."

## Chemists, Engineers, and Climate

**Chicago:** Edward G. Fochtman, research chemical engineer at Armour Research Foundation, recommends the selection of a limited area in the city where an all-out attack on air pollution would be conducted, to give scientists an opportunity to evaluate present theories as to the causes of pollution and practices which would reduce the smoke and dust.

**Los Angeles:** Dr. Lauren B. Hitchcock, F.A.I.C., announces the appointment of a technical advisory committee of seven men, "with broad scientific experience and knowledge in air pollution, which will advise the Board of Trustees of the Air Pollution Foundation on research projects." Chairman of the committee is Dr. Francis E. Blacet, chairman of the department of chemistry of the University of California at Los Angeles. Smog-sampling flights by two U. S. Naval Air Reserve blimps are being made at six levels.

**New England:** W. W. Horner, chairman of the Engineers Joint Council Water Policy Panel, recommends a search for more information before flood control of the small rivers and streams of New England can be achieved. "As far back as 1951, the Engineers Joint Council reported lack of important information of the New England rivers and recommended the installation of more measuring de-

vices in the areas where an overabundance of uncontrolled water has been a spectacular problem occurring only at long intervals." Additional funds should be made available to the Weather Bureau for the processing and analysis of weather data already on hand.

**Washington, D. C.:** Plans for the construction of a small, unmanned, earth-circling satellite vehicle to be used for basic scientific observations were announced by Detlev W. Bronk, president, National Academy of Sciences, and Alan T. Waterman, director, National Science Foundation. These two organizations will sponsor the project. Launching is planned for the International Geophysical Year during 1957 and 1958.

**New York:** "More than a million and a half tons of odorous, eye-smarting sulfur dioxide gas, from which 2.2 million tons of corrosive sulfuric acid may be formed, are poured into the N. Y. city atmosphere each year." Dr. Morris B. Jacobs, F.A.I.C., director of the laboratory of the N. Y. Department of Air Pollution Control made the statement at the 128th national meeting of the American Chemical Society.

**Organized:** A new rapid mail service for supplying sources of organic chemicals, by L. E. Mackay and E. A. Falco, formerly of Wellcome Research Labs. The name of the firm is Chemsearch, Box 224, New Rochelle, N. Y.

**Sales Incentive Plan:** Presented by Carl Evans, director of marketing, Plastics Div., Monsanto Chemical Co., to the Manufacturing Chemists' Association, Inc., at its Fourth Semi-annual Meeting, is based on the percentage of the particular industry each salesman sold in a given year. This becomes the base year and this figure is his par. In the following year, if his industry participation increased he would be paid a bonus, at a certain rate, for every dollar by which his sales exceeded par. The advantages: (A.) Each salesman's performance is not related to the performance of other salesmen who might have more favorable locations. Each salesman is judged only against his own performance in relation to the industry during the base period and under the same conditions. (B.) Changes in general economic conditions do not affect the measurement of the salesman's performance. He is judged by whether he sold more or less of the total industry volume than he did during the base year. If he did, he receives a bonus. (C.) It encourages the development of new accounts, since there is no place in the base period for accounts not sold. Volume from the new accounts would be gravy.

**Appointed:** Walter E. Brewer as new manager for the Textile Chemicals Division of the Nopco Chemical Co., Harrison, N. J.

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**Appointed:** William C. Foster, former deputy secretary of defense and president of the Manufacturing Chemists' Association, Inc., as executive vice president of Olin Mathie-son Chemical Corporation, 460 Park Ave., New York 22, N. Y.

**Prosperity:** Reigns in Western Europe while industrial production increased 5 per cent in 1953; 9 per cent in 1954, and an estimated 5 per cent in the first six months of 1955. So reports Dr. Robert S. Aries, F.A.I.C., New York, N. Y., upon his return from a three-month trip. "The relative boom in Western Europe, taking any postwar year as a base, exceeds its U. S. equivalent."

**Announced:** By Bruce M. Bare, F.A.I.C., marketing manager of organic chemicals, Dewey and Almy Chemical Co., division of W. R. Grace & Co., that polyvinyl acetate production is being doubled at the Cambridge and Acton, Mass., plants.

**Planned:** Construction of multi-million dollar vinyl acetate production facilities at Texas City, Tex., by Carbide & Carbon Chemicals Co., division of Union Carbide & Carbon Corp. Dr. H. B. McClure, F.A.I.C., president, expects completion of these facilities in the fall of 1956.

**Announced:** By White, Weld & Co., investment bankers, that Charles P. Neidig, F.A.I.C., has become a general partner of the firm and will be located in the Philadelphia office. He joined the company in 1952 as a chemical specialist.

**Appointed:** Robert B. Boyd, F.A.I.C., as sales manager of Oldbury Electro-Chemical Co., 19 Rector St., New York 6, N. Y. He was formerly assistant general sales manager.

**Honored:** Kenneth R. Brown, F.A.I.C., vice president of Atlas Powder Co., Wilmington, Del., who received the honor award of the Division of Carbohydrate Chemistry of the American Chemical Society, September 14th, in Minneapolis, Minn.

**Appointed:** Graham Barker, F.A.I.C., as industrial products technical representative of Emulsol Chemical Corp., division of Witco Chemical Co., New York 17, N. Y. He has been assigned to the New York-New Jersey area, with headquarters in Newark, N. J. He was formerly senior chemist at the Newark, N. J., plant of Diamond Alkali Co.

**Retired:** Arthur S. Elsenbast, F.A.I.C., as vice president of Johns-Manville Corporation, 22 E. 40th St., New York, N. Y. He is now located at Stanwich Lane, Greenwich, Conn.

**Moved:** Skeist Laboratories to 89 Lincoln Park, Newark, N. J. Directed by Dr. Irving Skeist, F.A.I.C., the company specializes in product, process and market research on polymers, plasticizers, resins, and coatings.

**Columnist:** Dr. Roger W. Truesdail, F.A.I.C., president of Truesdail Laboratories, Inc., of Los Angeles, Calif., who has been appointed to prepare the column, "Peeps at Things to Come," for the *Rotarian*, national magazine of the Rotary Club.

**Transferred:** Dr. Paul P. McClellan, F.A.I.C., from the New York Office to the Houston, Texas, office of Jefferson Chemical Company, Inc.

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"Bendix Ultra-Viscoson. For controlling flowcoating and paint spray operations." Information. Cincinnati Div., Bendix Aviation Corp., 203 W. 3rd St., Cincinnati 2, Ohio.

"LAGZ protective resin silicone coating and binder for asbestos and magnesia insulation." Information. West Chester Chemical Co., Box 39, West Chester, Pa.

"Polyfon for Chemical Fire Fighting Foams." Tech. Bulletin No. 304. Polychemicals Div., West Virginia Pulp & Paper Co., Charleston A, South Carolina.

"Solvents for Every Industrial Need." Folder. Modern Mineral Solvents Corp., State St., Perth Amboy, N. J.

"Danger at the Source." Documentary film about medical education in America. Black and white. 16 mm. Sound. 13½ minutes. Free. For information: Film, National Fund for Medical Education, 2 W. 46th St., New York 36, N. Y.

"Monamine Fatty Amides." Tech. Bulletin No. 222. Mona Industries, Inc., Chemical Div., Paterson 4, N. J.

"Ether Anhydrous AR with trace of sodium diethylthiocarbamate as stabilizer." Information. Mallinckrodt Chemical Works, St. Louis 7, Mo.

"The Tetrines," catalog on chelating and sequestering agents. Glyco Products Co., Inc., Empire State Bldg., New York 1, N. Y. .

"Some Properties of the Lighter Hydrocarbons, Hydrogen Sulfide & Carbon Dioxide." Monograph. \$10.00. American Petroleum Institute, 50 W. 50th St., New York 20, N. Y.

"Selected Scientific & Engineering Tables & Data." 112-pp. Handbook. Free. Write on company letterhead to H. M. Block, vice president, United States Testing Co., Inc., 1415 Park Ave., Hoboken, N. J.

"New Chemicals Available." Descriptive list. Bios Laboratories, Inc., 17 W. 60th St., New York 23, N. Y.

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"Analytical - Grade Chromatographic Alumina." Information. Bio-Rad Labs., 300 Delaware St., Berkeley, Calif.

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"Dimetcote, inorganic, metallic zinc coating for steel." Information. Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.

"Tinless, organic solder for metal." Information. Dewey & Almy Chemical Co., Div. W. R. Grace & Co., 62 Whittemore Ave., Cambridge 40, Mass.

"Petrothene Polyethylene Resins." Information, samples, data. U. S. Industrial Chemicals Co., Div. National Distillers Products Corp., 99 Park Ave., New York 16, N. Y.

"Washable Atomic Chart." 32" wide, 23" high. Price about \$3.00. Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.

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"Scientific Research Activities of Mellon Institute, No. 42." Available on request to Mellon Institute, 4400 Fifth Ave., Pittsburgh 13, Pa.

"Blue M's New Approach to Controlled Humidity." Bulletin 5525. Blue M. Electric Co., 138th & Chatham St., Blue Island, Ill.

"Fielden Proximity Meter Capacitance Gauge." Technical manual TM-951-1. Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 No. 4th St., Philadelphia 33, Pa.

"RH Laboratory Heater." Bulletin 627. Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill.

"Chemical Porcelain Laboratory Sinks," 20-pp. Request it from S. A. Lewis, The U. S. Stoneware Co., 60 E. 42nd St., New York 17, N. Y.

"OPTITHERM Infrared Detectors." Information. Barnes Engineering Co., 30 Commerce Road, Stamford, Conn.

"New Dryomatic Dehumidifier Featuring Thermostatic Control." Information. Dryomatic Corporation, Alexandria, Virginia.

"Safety Device for Inserting Glass Tubes in Stoppers, Corks, Bulbs." Information. Central Scientific Co., 1700 Irving Park Road, Chicago, Ill.

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Some people will believe everything you tell them—if you only whisper it.

Production of petrochemicals has doubled since 1940, with the present output of some 3,000 petrochemicals estimated at 32-billion pounds annually with a market value of about \$3-billion.

A three-way competition is developing between atomic energy, natural resources such as coal, gas, and oil, and solar energy, as the experts tell us that solar furnaces are no more expensive than electric arc furnaces of the same power.

The Firestone version of tree rubber (polyisoprene Coral) calls for 100 parts of isoprene to 0.1 part of lithium at 30° to 40°C., with the exclusion of moisture, oxygen, and oxygen-containing compounds.

A process for a new synthetic natural gas, developed at the Institute of Gas Technology, involves adding hydrogen to coal or oil during gasification and inducing methane formation through the use of catalysts, pressure, and temperature control.

There is a well-established correlation, according to the *Industrial Bulletin*, between research and development and increased productivity per capita, gross national product, and other criteria of economic growth.

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